

Attorney Docket No. 5649-1168
Application Serial No. 10/695,061
Filed: October 28, 2003
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REMARKS

This response is submitted in reply to the Office Action mailed February 9, 2005 ("the Action"). Claims 1-7 and 27-35 are pending in the application.

I. Allowed/Allowable Claims

Applicants acknowledge with appreciation, the Examiner's statement that Claims 1-7 are allowed and Claims 30, 31 and 34 recite allowable subject matter and would be allowed if rewritten into independent form including the limitations of the base claim and any intervening claims. Claims 30, 31 and 34 have been rewritten into independent form incorporating the base claim and the limitations of any intervening claims. As such, Applicants respectfully submit that amended Claims 30, 31 and 34 are in condition for allowance, which action is respectfully requested.

II. The Drawing Objection

The Examiner objects to the drawings for failing to illustrate the bottom surface of the gate electrode contacting the semiconductor substrate as recited in Claim 31. Currently, each of the figures shows the bottom surface of the gate electrode 160 as contacting a gate oxide layer 140, which resides on the substrate 100. To address this rejection, Applicants have amended Claim 31 to recite that the bottom surface of the gate electrode 160 resides on the semiconductor substrate, which means directly or indirectly (see p. 13, lines 17-20 of the application).

III. The Claim Objection

The Action objects to the claim informality in Claim 32. Applicants have amended Claim 32 with the suggested clarification added above.

IV. The Art Rejections

The Action rejects Claims 27-29 and 35 as being anticipated by U.S. Patent No.

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6,294,449 to Wu ("Wu"). Claims 27, 28 and 35 are also rejected as being anticipated by U.S. Patent No. 6,734,564 to Cronin ("Cronin"). Claims 32 and 33 stand rejected as being obvious over Wu in light of U.S. Patent App. Publication 2002/0195672 to Lee ("Lee").
Applicants respectfully disagree.

More particularly, the Action states (p.3 of the Action) that Figure 7 of Wu illustrates that portions of selected adjacent sidewalls of neighboring electrodes "angle" generally downwardly and inwardly toward each other while the opposing sidewall is substantially linear.

Claim 27 recites:

An integrated circuit assembly, comprising:
a plurality of gate electrodes disposed on a substrate, the gate electrodes having opposing sidewalls and top and bottom surfaces, wherein portions of selected adjacent sidewalls of neighboring electrodes angle generally downwardly and inwardly toward each other while the opposing sidewall of each of the selected sidewalls are substantially linear, wherein the angled neighboring sidewall portions of the selected gate electrodes have a generally constant downward slope from a top portion of a respective gate electrode to a medial portion thereof, and wherein, for a respective selected gate electrode, the opposing sidewall has a different profile shape.

Wu fails to teach or suggest at least the emphasized features.

With respect to Cronin, the Action cites Figures 4 and 5a-c as disclosing the subject matter recited in Claims 27, 28 and 35. However, with respect to Claim 27, assuming that the conductive lines 42, 44 correspond to conductors 20/22 (and are gates) as purported by the Action, Figures 5a-5c fail to illustrate the sidewall profiles of the gates 20/22 as claimed. Instead, *inter alia*, both sidewalls of adjacent gates have the same shape. Cronin fails to teach or suggest at least the emphasized feature.

Further, neither Wu nor Cronin teach or suggest the configuration recited in the dependent claims. For example, that the contact window sidewalls comprise an angled profile with an angled portion having a generally constant slope that corresponds to the angled gate electrode sidewall configuration (as recited in Claim 28) and the features recited in new Claims 37-40.

With respect to Claim 35, the Action states that Figure 7 of Wu illustrates the claimed

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subject. However, as discussed above, Wu fails to teach or suggest that the angled portion of the sidewall has a generally constant slope from a top surface to an intermediate portion. The Action also states that with respect to Cronin, "the entire gate sidewall is straight and angled toward the recess. Therefore, the "intermediate portion" can be any portion along the sidewall." Action, at page 5, third paragraph. Applicants respectfully disagree. Irrespective of whether the sidewall is straight or angled, the sidewall has an intermediate portion. In the structure proposed by Cronin, the gate sidewall is linearly angled along its entire distance (not straight) and the contact window is straight proximate the intermediate portion of the gate electrode, but angled at the lowermost portion thereof. Thus, Cronin does not illustrate the claimed configuration of the gate electrode sidewall or the conductive contact.

Claim 35 recites:

A semiconductor assembly, comprising:
a conductive contact on a substrate in a recess adjacent to a gate electrode having an opposing top and bottom and a gate electrode sidewall that extends from a top surface to the bottom of the sidewall, the gate electrode sidewall angling inwardly with a generally constant slope from the top surface to an intermediate portion of the sidewall toward the recess with a lower portion of the sidewall being substantially vertical so that the bottom of the electrode has a greater width than the top, the conductive contact having a profile with an angled portion having a generally constant slope that corresponds to the slope of the angled gate electrode sidewall and an upper portion that extends above the top surface of the gate electrode.

Applicants submit that Claim 35 is patentable over the cited references for at least the underlined features.

The Action also rejects Claims 32 and 33 as being obvious over Wu in view of U.S. Patent Application Publication No. 2002/0195672 ("Lee"). Applicants disagree. Wu has the deficiencies noted above and Lee fails to resolve those deficiencies.

Claim 32 recites in part:

A semiconductor assembly with self-aligned contact pads, comprising:
a cell array region comprising:

first and second gate electrodes disposed on a semiconductor substrate, the first and second gate electrodes having opposing first and second sidewalls and top and bottom surfaces, wherein portions of the adjacent sidewalls of the first and second gate electrodes are configured to angle generally downwardly and inwardly toward

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each other with a generally constant slope from a top portion to at least about a medial portion thereof;

a contact window positioned between the adjacent sidewalls of the first and second gate electrodes, wherein the contact window sidewalls comprise an angled profile portion with a generally constant slope that corresponds to the slope of the angled portion of the gate electrode sidewalls....

Dependent Claim 33 recites independently patentable subject matter. Applicants submit that cited references fail to teach or suggest at least the underlined features in Claims 32 and 33 and that Claims 32 and 33 are patentable over the cited references.

V. New Claims

Applicants have added new Claims 37-40 in order to form a more complete claim set. Applicants submit that the claims are supported by the application and figures. Entry and consideration of the new claims is respectfully requested.

VI. Conclusion

Accordingly, Applicant submits that the present application is in condition for allowance and the same is earnestly solicited. Should the Examiner have any matters outstanding of resolution, he is encouraged to telephone the undersigned at 919-854-1400 for expeditious handling.

Respectfully submitted,



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Rosa Lee Brinson